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STRAIN GAGE SWITCH & BALANCE UNIT

MODEL C-10T AND C-10LTC

OPERATING MANUAL

INSTRUMENTS Bud DIVISION

PHOENIXVILLE, PA.

I-03-3

STRAIN GAGE SWITCH & BALANCE UNIT

MODEL C-10T AND C-10LTC

OPERATING MANUAL

INSTRUMENTS DIVISION
of The Budd Company

IMPORTANT NOTE:

This manual is written to cover those two models of the C-10 series Switch and Balance Unit which are provided with major optional features. Other models, identifiable by omission or addition of alpha characters to the model designation, differ from the models described in this manual as follows:

a. Models C-10, C-10L, and C-10LC: The ten individual input connectors (transducer receptacles) are not supplied with these models. Ignore all references made in the manual to these receptacles or to full bridge inputs.

b. Models C-10L and C-10LT: Channel identification contact closures, wired to pins 1-19 inclusive of "IN" and "OUT" control connectors, are omitted in these models. Ignore references made in Section 5 of the manual to channel identification wiring.

c. Any model with "K" suffix: Digital indicating knobs are provided for each balance control, allowing resetting of controls to known reference points. All other features are in accordance with the remainder of the model designation notation.

d. Any Model with "R" suffix: A 19" rack mounting panel (5-3/32" high) replaces the standard portable cabinet panel.

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STRAIN GAGE SWITCH & BALANCE UNIT

MODEL C-10T AND C-10LTC

OPERATING MANUAL

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STRAIN GAGE SWITCH & BALANCE UNIT

MODEL C-10T AND C-10LTC

1. GENERAL DESCRIPTION

The Model C-10T Strain Gage Switch & Balance Unit provides the functions of bridge zero conditioning and channel switching for multi-channel strain gage static measuring systems. Up to ten strain gages or similar resistance bridge transducers can be accommodated by a single Switch and Balance unit, and as many channels as desired may be obtained by cabling additional units in parallel. Ten potentiometers (ten-turn type) provide means for adjusting the initial electrical balance of the strain gage bridge input to each channel. A rotary switch selects any one of the input channels and connects it to the single output connector. Particular attention has been paid in design to take advantage of the accuracy and stability of 120 ohm temperature compensated foil gages. The use of such gages with this Switch and Balance Unit, and with the proper accessory equipment, permits considerable savings in time and material over methods previously required to obtain reliable strain gage data.

Switch and Balance Unit Model C-10LTC provides for automatic channel advance and programming required for automatic digital data recording systems. In other respects it is identical to the Model C-10T. Other model variations are supplied to customer specifications. Difference data for the Model C-10LTC (or other models) are supplied in Section 5 of this manual.

1-1. ACCESSORY EQUIPMENT

The equipment normally required in addition to the Model C-10T Switch and Balance Unit is as follows:

a. A readout instrument in which DC is employed for bridge excitation, such as the Budd Model A-110 Digital Strain Indicator.

b. 5 Channel Input Adapter Cables, for convenience in making remote half or quarter bridge connections, using 2 or 3 wire hookup, from strain gage installations to the Switch and Balance Unit. Two such cables (one Model K-101 and one Model K-102) are required for each ten channels.

c. Mating connectors, if cables in (b) are not used.

d. Output cable for connection to the readout instrument. One such cable to mate with any model Budd servo-balanced readout instrument is supplied with each Switch and Balance Unit.

e. Junction cable, Model K-100, to connect as many as five Switch and Balance Units to one readout instrument. (Not required when using only one Switch and Balance Unit.)

f. Portable cabinet Model T-100, suitable for containing two Switch and Balance Units (twenty channels).

2. PRINCIPLES OF OPERATION

The two basic functions of a Switch and Balance Unit are, as the name implies:

a. To provide properly designed, low resistance switching which will accommodate any of the bridge connections commonly used in wiring of strain gage installations. This includes quarter bridge, half-bridge and full 4-arm bridge connections.

b. To provide individual resistive balance controls which can be used in adjusting the inputs to the readout instrument to zero for initial test conditions.

For normal usage of the Switch and Balance Unit with half or quarter bridge connections, it is necessary to provide a set of dummy bridge resistors at the output side of the

unit. This set is then common to all inputs, and serves to complete a full bridge network to the readout instrument. A DC excitation supply, which need only furnish current to one bridge at any one time, must also be connected at the output side of the Switch and Balance Unit. The Budd Model A-110 Digital Strain Indicator will plug directly into the Switch and Balance Unit and will meet both requirements (resistor set plus DC excitation). Full bridge strain gage or transducer inputs require only the DC excitation supply, and the resistor set must be disconnected or switched out of the circuit.

2-1. CIRCUITS

Individual input receptacles, one for each channel, permit intermixing of full, half, and quarter bridge inputs to a single Switch and Balance Unit. These individual receptacles will be hereafter referred to as "transducer receptacles" to distinguish between other receptacles. Two 5-channel receptacles are also provided for a faster, more convenient wiring installation where all half bridges or all quarter bridges are to be used. The Budd Models K-101 and K-102 input cable adapters plug directly into these 5-channel receptacles. A simplified circuit, showing typical through wiring for a single channel, is shown in Figure 1. Figures 2 and 3 illustrate input wiring for various bridge configurations.

2-1-1. Balance Circuit. In Figure 1, note that the Balance Control circuit consists of a 50K potentiometer and a 30K resistor. Adjustment of the potentiometer creates a variable shunting effect on one of the bridge arms which is connected to the S2 terminal. For half and quarter bridge inputs, the potentiometer should be adjusted so that the half bridge at the readout instrument is initially unbalanced to the same extent as the remainder of the bridge which includes the active gage(s). This will result in zero indication of the readout instrument for zero strain applied to the gages. The normal range of unbalance which can be accommodated is ±0.8% for 120 ohm quarter bridge inputs (assuming the standard 240 ohm half bridge resistors employed in the Model A-110 Digital Strain Indicator). For full bridge inputs, the amount of unbalance which can be accommodated is in direct proportion

to bridge resistance. Increased balance range is obtainable by shunting additional resistance across the binding posts provided for this purpose. Note that, for half and quarter bridge operation, the active gages are neither shunted nor loaded by the balance control. A possible source of error is therefore eliminated. For full bridge operation, the loading effect of the balance circuit may have to be accounted for if active gages are located in the S2 side of the bridge. For 120 ohm full bridges, however, the error due to the loading of the balance circuit should normally be less than 1/4%, depending upon the amount of unbalance, location of active gages, etc.

2-1-2. Switching Circuit. Six pole switching is provided as shown in Figure 1. All the switch decks shown are heavy gold plate over silver alloy to insure stable contact resistance and low thermal emf. Decks A, C, and D, since they switch connections inside a bridge circuit, are especially critical with respect to stable contact resistance. These decks are therefore specially constructed with a minimum of four parallel paths at each sliding contact. Errors attributable to variation of switch contact resistance in 120 ohm gage installations are consistently below ±1 microinch per inch equivalent strain.

3. OPERATING PROCEDURE

The Switch and Balance Unit is an intermediate instrument between a strain gage installation and a readout instrument. The following procedure is written on the basis that the gage installation and readout instrument are as recommended by The Budd Company. Use of other equipment may require some modifications of the procedures outlined in this manual.

3-1. CONTROLS

The functions of the front panel operating controls for the Model C-10T Switch and Balance Unit are as follows:

a. CHANNEL. A rotary selector switch for connecting the channel to be measured into the readout instrument. There are ten active positions, labeled 0 through 9, and two inactive, or off, positions.

b. BALANCE. Individual ten turn potentiometers for electrically balancing the signal from each channel to zero prior to a test. Locking Knobs prevent inadvertent loss of the setting.

3-2. CONNECTORS AND BINDING POSTS

The rear panel of the Switch and Balance Unit includes the following sets of connectors and binding posts:

a. Ten individual transducer receptacles. Labeled for channels 0 through 9. Wiring to these receptacles may be for intermixed quarter, half, and full bridge inputs. Mating plugs are Amphenol-Borg Electronics Corp. Catalog No. 165-13.

b. Two 5-channel input receptacles, labeled for channels 0-4 and channels 5-9. Wiring to these receptacles must be either all quarter bridges or all half bridges for any one test setup. Mating plugs are Amphenol-Borg Electronics Corp. Catalog No. 165-26.

c. One output receptacle, labeled "INDICATOR". An interconnect cable is normally furnished for use between this receptacle and any model Budd servo-balanced readout instrument. The mating connector is Amphenol-Borg Electronics Corp. Catalog No. 165-14.

d. Half bridge-quarter bridge binding posts labeled as such, and also designated by "A", "B", and "C". A shorting link is provided with this set of binding posts, which must be used in accordance with the diagrams of Figures 2 and 3.

e. Ten pairs of binding posts, labeled 0 through 9. A 30K balance limiting resistor for each channel is internally connected across each pair of posts. To achieve wider balance range for any channel, external resistance must be shunted across the appropriate pair of posts.

3-3. INPUT CONNECTIONS

Input connections are made by one of three methods:

a. Soldering to mating plugs for the two 5-channel input receptacles, for half or quarter bridges; or

b. Use of Model K-101 and K-102 5-channel cables, in which case half or quarter bridge connections are made to binding posts provided at the cable termination; or

c. Soldering to mating plugs for the individual transducer receptacles (when provided), for full, half, or quarter bridges.

3-3-1. Quarter Bridge. It is recommended that the three-wire connection be considered for quarter bridge installations, to provide compensation for possible variations of lead wire resistance with temperature. Figures 2A and 2B illustrate the three-wire connections, as it is made to each gage through the 5-channel receptacles. Depending upon location of the dummy resistor or compensating gage, the shorting link at the half bridge-quarter bridge binding posts must be as shown in these same figures. The "+", "S1", and "D" nomenclature is translated to connector pin numbering in Table 1. Where the 5-channel cables are used, the binding posts are identified by channel number and by the "+", "S1", and "D" notation.

TABLE 1

5-CHANNEL RECEPTACLE WIRING

Channel No.		Pin Connection		
0-4 Receptacle	5-9 Receptacle	+	S1	D
0	5	b	a	Z
1	6	s	x	R
2	7	M	T	L
3	8	K	D	B
4	9	A	C	E

Quarter bridge connections may also be made through the individual transducer receptacles, in which case the diagrams of Figure 3A and 3B apply.

If it is definitely known that leadwire resistance variations will be insignificant, then a two-wire connection to the gage is permissible. Instead of making the common connection at the gage, leads "S1" and "D" are jumpered at any convenient location between connector and gage. Due to the fact that all quarter bridge inputs to any one Switch and Balance Unit share a common dummy, they must have the same nominal resistance value as the common dummy.

There is one special case worthy of mention where a two-wire gage connection is recommended over the three-wire arrangement. This would occur where leadwire resistance to active gages and to a compensating gage (Fig. 2B) were nominally equal and were subject to the same temperature variation. In such cases, two wires only should be run to each gage, with the common connection between leads "S1" and "D" made at the Switch and Balance Unit input

connector rather than at the active gage. This common connection may be conveniently made by installing a jumper wire between pins B and C of the individual transducer receptacle for the particular channel in question.

The "S2" portion of the Bridge (Fig. 2) is intended to be completed at the readout instrument. Budd servo-balanced indicators, if used, should be set for half bridge operation. However, if other channels in a measurement system are to be full bridges, the readout instrument must be set for full bridge. In this case pins E and F of the transducer receptacles, for those channels in which inputs are either quarter or half bridges, must be jumpered. This completes a circuit from S2 back to the internal half bridge at the readout instrument.

3-3-2. Half Bridge. For half-bridge inputs through the 5-channel connectors, lead "D" is reconnected (by means of the shorting link) to become negative bridge power instead of the third wire as in the quarter bridge connection. Refer to Figure 2C. Pin numbering for the two 5-channel connectors is given in Table 1.

Half bridges and quarter bridges cannot be intermixed when all wiring is made through the 5-channel receptacles, due to the different requirements for the shorting link. Where intermixing is required, those channels which are half bridges must be wired through the individual transducer receptacles as shown in Figure 3C. The "S2" portion of the bridge must be completed either by setting the readout instrument for half bridge operation, or by jumpering pins E and F of the individual transducer receptacles as in Figures 3A, 3B, and 3C.

3-3-3. Full Bridge. The wiring for full bridge inputs is as shown in Figure 3D, through the individual transducer receptacles only. The readout instrument must be set for full bridge inputs. If other channels in the system are wired for half or quarter bridges, the comments in paragraphs 3-2-1 and 3-2-2 regarding the jumpering of pins E and F for these channels must be observed.

3-4. OUTPUT CONNECTIONS

An output cable is normally supplied with each Switch and Balance Unit for direct connection to any model Budd

servo-balanced readout instrument. Where multiple Switch and Balance Units are to be used, corresponding output terminals from each unit must be connected together, then to the readout instrument. A convenient method of doing this is by means of a Model K-100 junction cable, which will parallel up to five Switch and Balance Units into a single readout instrument. Output cable pin connections are as shown in Figure 1.

3-5. SYSTEM CONNECTIONS

Where Switch and Balance Units are to be used as part of a Budd system, equipment and cabling should be connected per Figure 4. Ignore the equipment and cabling indicated by the dashed lines if the system does not include a data printer.

3-6. BALANCE LIMITING RESISTORS

The 30K balance limiting resistor, shown in typical channel wiring in Figure 1, determines the amount of initial bridge unbalance which can be accommodated. When the Model A-110 Digital Strain Indicator is used for readout with half and quarter bridges, the unbalance range is nominally ±0.8%. For full bridges, the range will depend upon absolute bridge resistance. Sets of binding posts at the rear of the unit provide a convenient means of shunting the internal 30K resistors for increasing the unbalance range. It should rarely be necessary to provide shunting resistors less than 10K if reasonable care has been used in gage selection and installation.

3-7. OPERATION

With connections made as in paragraphs 3-3 and 3-4, select any one of the inputs by means of the CHANNEL switch. If two or more Switch and Balance Units are paralleled, be sure that the CHANNEL switches of all inactive paralleled units are set to OFF position. The readout instrument will now be measuring the unbalance voltage of the composite bridge network as seen from the readout instrument. The electrical balance of this network is adjustable by means of the BALANCE control for the particular channel being measured. After initial adjustment, which is generally for zero indication of

the readout instrument for zero applied load on a test structure, the BALANCE knob should be locked in position. If the BALANCE control for any channel has insufficient range to bring the readout to zero, the associated balance limiting resistor will require shunting, as described in paragraph 3-5. After completion of the initial balancing sequence for all channels, subsequent measurements may be made as dictated by the test program.

4. SERVICING AND MAINTENANCE

Under normal conditions, maintenance should be limited to visual and electrical inspection for defective components and wiring. Clean dry air should be used to blow out dust accumulation, especially in the vicinity of the CHANNEL switch contacts and mechanism. In extreme cases where there is evidence that foreign matter is responsible for erratic switch performance, the contacts, detent, and bearings should be washed down with triclorethylene and blown dry. The switch contacts and mechanical parts should then be relubricated with a thin film of MIL-G-5278 grease.

Refer to Fig. 1 and Table 1 for schematic wiring details. In Fig. 1, note that all wiring shown to the left of the CHANNEL switch is duplicated for each of the ten input channels. Budd drawing 400-050677 will also be of assistance.

4-1. ELECTRICAL PARTS LIST

Part Description	Manufacturer & Catalog Number	Quantity
Balance Potentiometer	Spectrol Model 510, 50K ohms ±3%	10
Channel Switch	Budd Part No. 200-033708	1
Balance Limiting Resistor	Texas Inst. CD 1/2 MR, 30K ohms ±1%	10
Transducer Receptacle	Amphenol Cat. No. 165-16	10
a. Mating Plug	Amphenol Cat. No. 165-13	
5-Channel Receptacle	Amphenol Cat. No. 165-27	2
a. Mating Plug	Amphenol Cat. No. 165-26	
Output Receptacle	Amphenol Cat. No. 165-15	1
a. Mating Plug	Amphenol Cat. No. 165-14	
Indicator Patch Cable Assy (K-200)	Budd Part No. 200-033791	1

5. MODEL VARIATION DIFFERENCE DATA - MODEL C-10LTC

5-1. GENERAL

The Model C-10LTC Switch and Balance Unit incorporates all the features of the Model C-10T as described in Sections 1, 2, and 3 of this manual, with the additional capability of remotely controlled channel switching. Provision is also made for programming the operation of cascaded units, and for electrical channel identification (up to a maximum of 100 channels) when units are to be used in an automatic data recording system. Insofar as strain gage input considerations are concerned, operation of the Model C-10T and C-10LTC are identical.

The controlled element in the Model C-10LTC is the solenoid driven channel selector switch, labeled CHANNEL-UNITS. This switch will, upon being energized, automatically advance one position. Manual operation is also possible. Control circuitry for this switch is such that, for a system incorporating several cascaded Switch and Balance Units, only one unit is active at any one time. After Channel 9 readout has been completed in any one unit, control circuit functions are automatically transferred to a following unit. The CHANNEL-UNITS selector switch of the completed unit will return to OFF or "home" position, and the unit to which control functions are transferred will switch to Channel 0.

The programming switch (labeled OMIT-EXTEND-STOP) permits modifying the transfer circuit between units. By this means, any group of ten channels may be omitted from a readout sequence, the control circuits may be extended through to a following unit after Channel 9 readout has been completed, or the transfer to a following unit may be stopped entirely after Channel 9 readout has been completed.

Control voltages for the Model C-10LTC are not self-contained, but must be supplied from a properly designed auxiliary control unit. One such unit is the Budd Model E-140 Printer Control Unit, for systems which utilize Data Printers as manufactured by either Clary Corp. or Victor Adding Machine Co.

5-2. CIRCUITS

There are five basic functions which must be provided for by the control circuits (see the Schematic, Drawing 400-050677):

a. Channel identification by means of contact closures representing decimal digits 1 through 9. Note that contact closures are not provided for decimal digit 0. This Switch and Balance Unit is intended for operation with either the Clary or Victor Data Printers, in which case the digit 0 is automatically entered in the absence of any other entry. Decimal units digits are wired to correspond to the CHANNEL-UNITS switch position. Decimal tens digits correspond to the CHANNEL-TENS switch position.

b. An "advance" circuit which, when energized, will cause the CHANNEL-UNITS switch to advance one position. If this switch is at OFF, it will not advance, but the control voltage is transmitted through to a following unit.

c. A "carry" circuit which can receive a signal causing the CHANNEL-UNITS switch to advance to Channel 0 from the OFF position. The "carry" circuit also sets up a connection to a following unit when the CHANNEL-UNITS switch is at 9. At this position, the next "advance" signal will not only step the CHANNEL-UNITS switch from 9 to OFF, but the following unit is stepped from OFF to Channel 0.

d. A "start" circuit, which is required only when all CHANNEL-UNITS switches of all Switch and Balance Units in a system are OFF, and it is necessary to remotely advance the first unit to Channel 0. To set up this circuit, the "start" circuit must be energized, and the "carry" and "home" circuits must be simultaneously shorted together.

e. A "home" circuit which, when energized, will automatically return all CHANNEL selector switches in a system to OFF or "home" positions.

All control functions can be performed by wiring the source of control voltages to the 25-pin male IN connector of the first Switch and Balance Unit in a system. Following units, if any, are cable-connected to the 25-pin female OUT connector of a preceding unit. As many units as necessary can operate in this manner from a single control source.

Control circuits are designed to operate from a nominal 100 VDC source, obtained by full wave rectification of the 117 volt 60 cycle line. The negative side of the DC source must be connected to "control common".

5-3. OPERATING PROCEDURE

Operating procedures for the Model C-10LTC, insofar as the basic functions of strain gage switching and balancing are concerned, are identical with those of the Model C-10T as described in Section 3 of this manual. The following paragraphs describe only the additional operating considerations made necessary by the automatic control features of the Model C-10LTC.

5-3-1. Controls. Panel controls which differ from those of the Model C-10T are as follows:

a. CHANNEL-UNITS. This switch performs strain gage input switching. Its function is identical to the CHANNEL switch of the Model C-10T with additional provisions for channel identification wiring and solenoid control.

b. CHANNEL-TENS. A switch for identifying, in terms of a decimal tens digit, the active switch and balance unit in a multiple unit system. For example, with this switch at 2, channels wired to this particular unit

will be identified as 20, 21, 22, 23, 24, 25, 26, 27, 28 and 29. It is important to note that this switch is for purposes of identification only, and does not affect either the strain gage input circuits or the control circuits for the CHANNEL-UNITS switch.

c. OMIT-EXTEND-STOP. A programming lever switch which permits the operator (1) to omit the unit from a readout sequence, (2) to automatically extend the control circuits through to a following unit after Channel 9 readout has been completed, or (3) to stop the transfer to a following unit from occurring at all after Channel 9 readout has been completed.

5-3-2. Connections. All control circuit input wiring is through the 25-pin male IN connector (mating connector in Cannon Electric Co. DB-25S). For multiple unit systems, the 25-pin female OUT connector (mating connector Cannon DB-25P) must be wired pin-to-pin to the IN connector of the following unit, and so on for as many units as desired. This cable assembly is supplied as standard equipment with any C-10 series unit capable of programming. See the Schematic Diagram Drawing 400-050677 for wiring details. The solenoid control circuits (connector pins 21 through 25) should be energized only with a nominal 100 VDC source, with pin 25 to negative side of the source. Any other applied voltage may cause damage to circuit components. Channel identification circuits (pins 1 through 19) are contact closures to be wired to external equipment, and any reasonable voltage and current may be handled. Normal limits are 500 VDC or peak AC, and 2 amperes RMS current. Because of the high sensitivity of strain gage circuits to stray pickup, it is good practice to disconnect both sides of control voltage sources when they are not actually being used for switch control or for channel identification.

5-3-3. Operation. The CHANNEL-TENS switches and the OMIT-EXTEND-STOP (programming) switches for each Switch and Balance Unit in a measurement system should be

set according to their functions as described in paragraph 5-3-1. Manually or remotely position the CHANNEL-UNITS switch of a Switch and Balance Unit to the particular channel with which a readout sequence is to start. The CHANNEL-UNITS switches of all other Switch and Balance Units in the measurement system must be OFF. Subsequent operation will depend upon the sequence of control voltages applied from a system control unit.

5-4. SERVICING AND MAINTENANCE

Under normal conditions, maintenance should be limited to visual and electrical inspection for defective components and wiring.

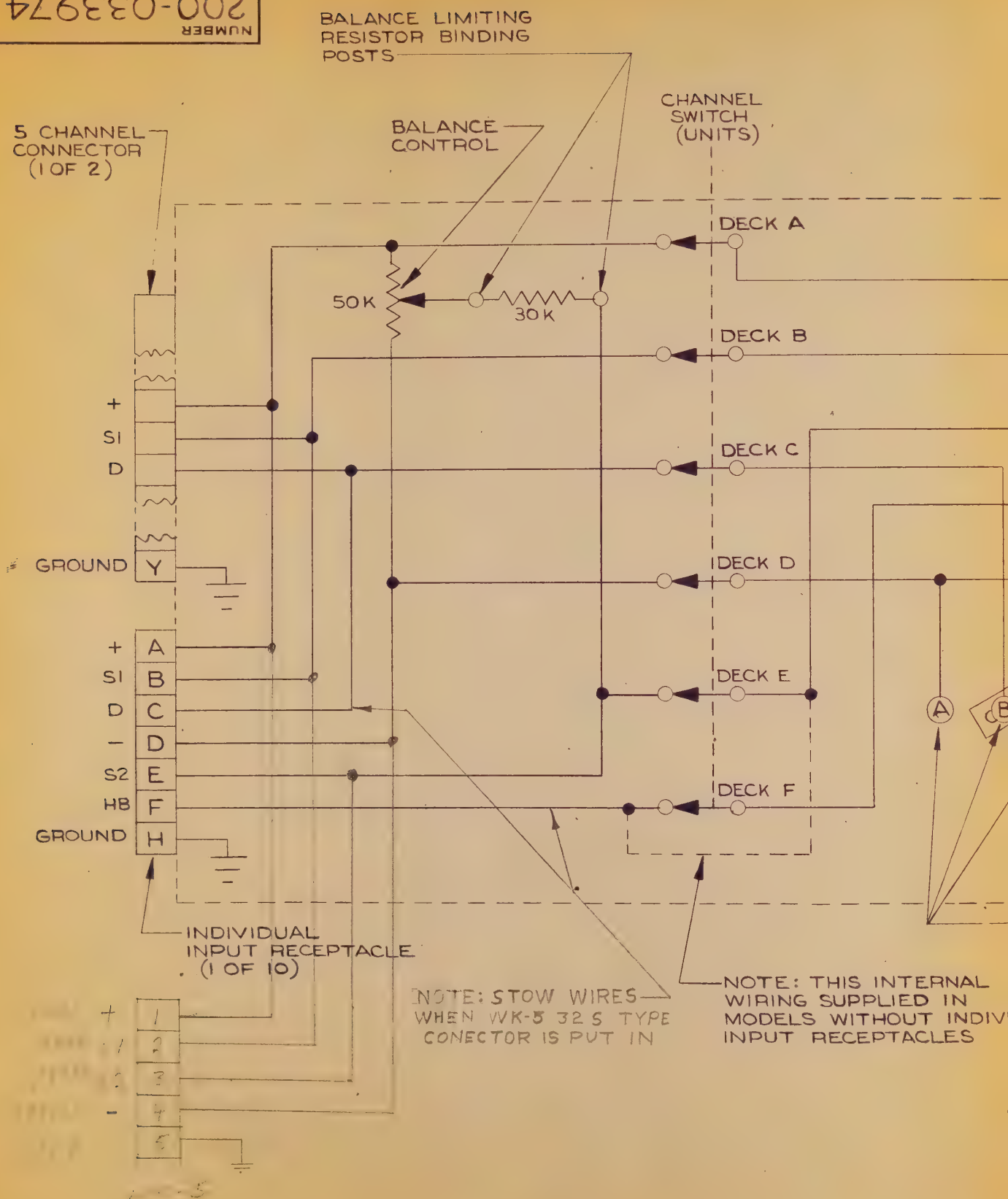
Clean dry air should be used to blow out dust and accumulation, especially in the vicinity of the CHANNEL-UNITS switch contacts and drive mechanism.

In extreme cases where there is evidence that foreign matter is responsible for erratic switch performance, the contacts, detent, ratchet, etc., should be washed down with trichlorethylene and blown dry. The switch contacts, detent, and shaft bearing should be relubricated with a thin film of MIL-G-5278 grease. The drive mechanism, including ratchet, latch, and return spring, should be lubricated sparingly with Dow-Corning DC-510.

5-4-1. ELECTRICAL PARTS LIST - CONTROL COMPONENTS

Part Description	Manufacturer & Catalog Number	Quantity
CHANNEL-UNITS Switch	Budd Part No. 300-042579	1
CHANNEL-TENS Switch	Centralab PA-1001	1
OMIT-EXTEND-STOP Switch	Switchcraft 130312L	1
IN Connector	Cannon DB-25P	1
a. Mating Connector	Cannon DB-25S	
OUT Connector	Cannon DB-25S	1
a. Mating Connector	Cannon DB-25P	
Resistor, R201	10 Ohms ±10%, 1/2 W	1
Capacitor, C201	0.50 mfd., 600 V	1
Rectifier, CR201	Texas Inst. 1N2071	1
IN/OUT Patch Cable Assy (K-201)	Budd Part No. 200-033798	1

NUMBER 200-033974



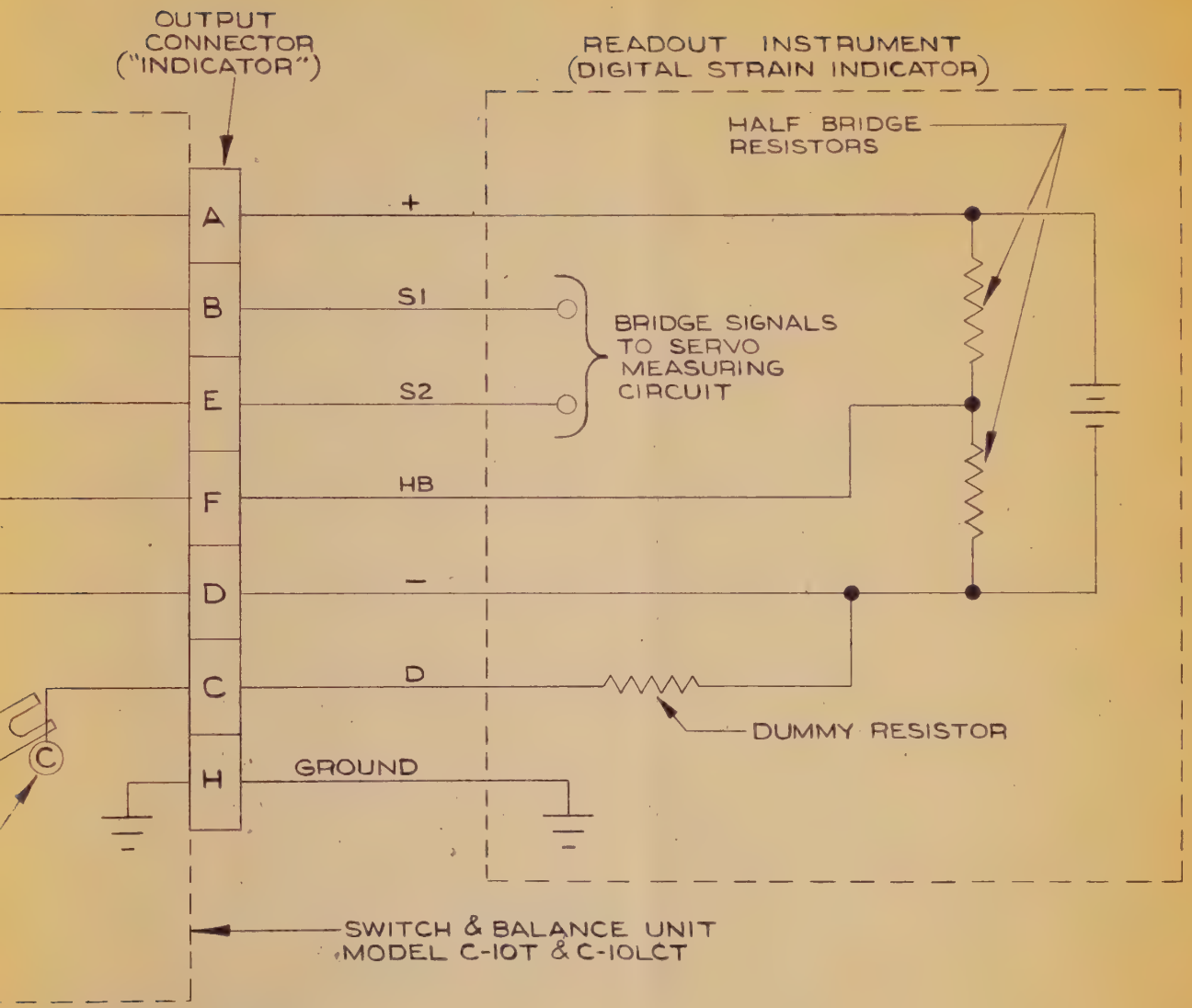


FIGURE 1

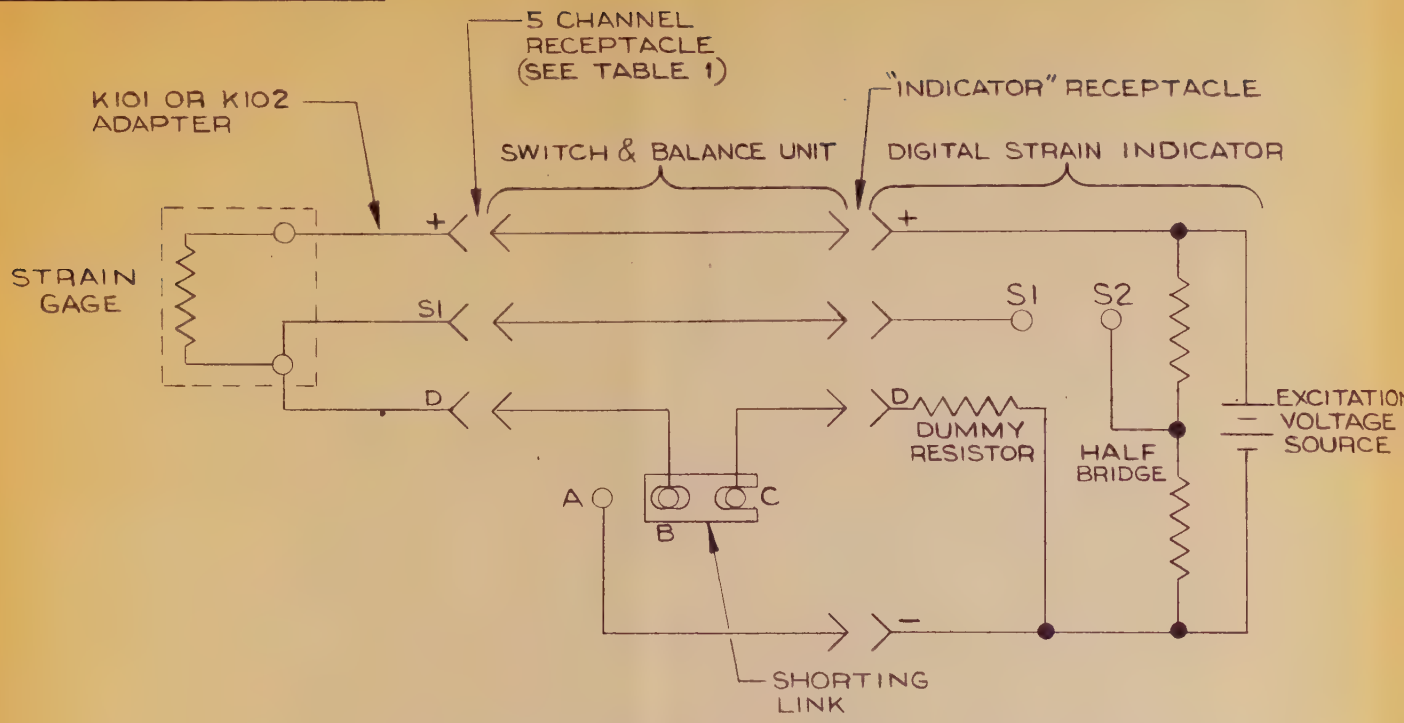
TYPICAL WIRING FOR ONE CHANNEL OF SWITCH & BALANCE UNIT THRU TO READOUT INSTRUMENT.

DRAWN DELTUFFO	DATE 8-30-62		DATE 9-11-62	NUMBER 200-033974
DESIGNED	DATE 9-11-62	APPROVED	DATE	SHEET 1 OF 4

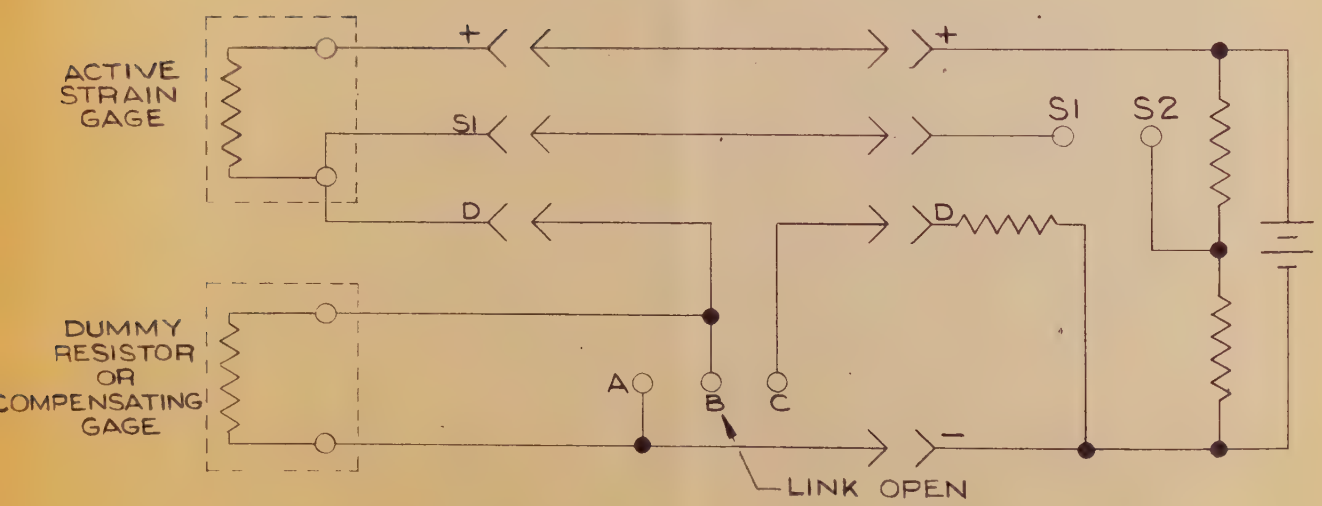
TITLE

OPERATING MANUAL
DATRAN SWITCH & BALANCE UNIT

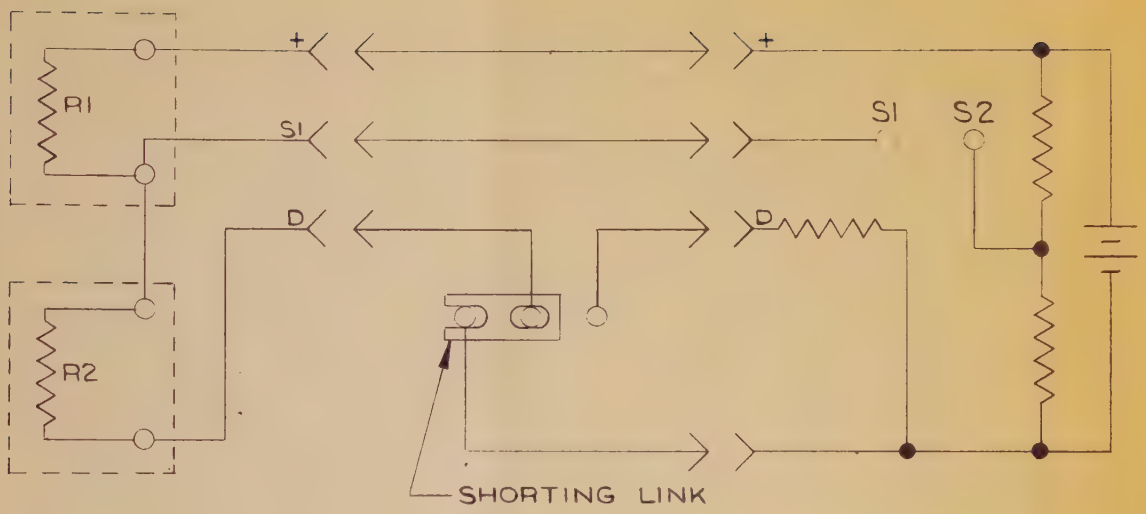
INSTRUMENTS Budd DIVISION
BOX 245 PHOENIXVILLE, PA.



A. QUARTER-BRIDGE, DUMMY IN DIGITAL STRAIN INDICATOR



B. QUARTER BRIDGE, DUMMY OR TEMPERATURE COMPENSATING GAGE AT SWITCH & BALANCE UNIT



C. HALF-BRIDGE (OR QUARTER BRIDGE WITH COMPENSATING GAGE R2 AT ACTIVE GAGE).

CHANNEL NUMBER		PIN ASSIGNMENT		
0-4 RECEPTACLE	5-9 RECEPTACLE	+	SI	D
0	5	b	a	Z
1	6	S	X	R
2	7	M	T	L
3	8	K	D	B
4	9	A	C	E
GROUND PIN Y				

TABLE 1. PIN ASSIGNMENT FOR 5 CHANNEL RECEPTACLE WIRING

FIGURE 2

INPUT WIRING TO 5 CHANNEL RECEPTACLES OR INPUT ADAPTER CABLES K101 & K102

DRAWN DELTUFFO	DATE 8-24-62	JCH	DATE 9-11-62	NUMBER 200-033974
DESIGNED JCHastings	DATE 9-11-62	APPROVED	DATE	SHEET 2 OF 4

TITLE

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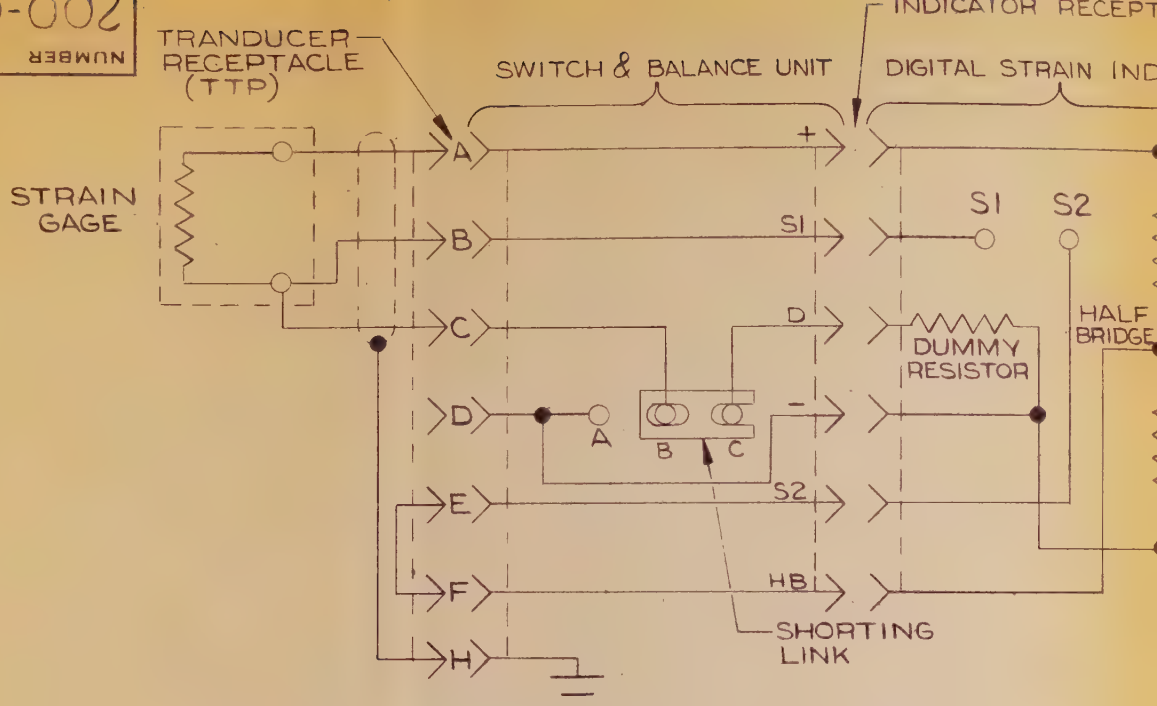
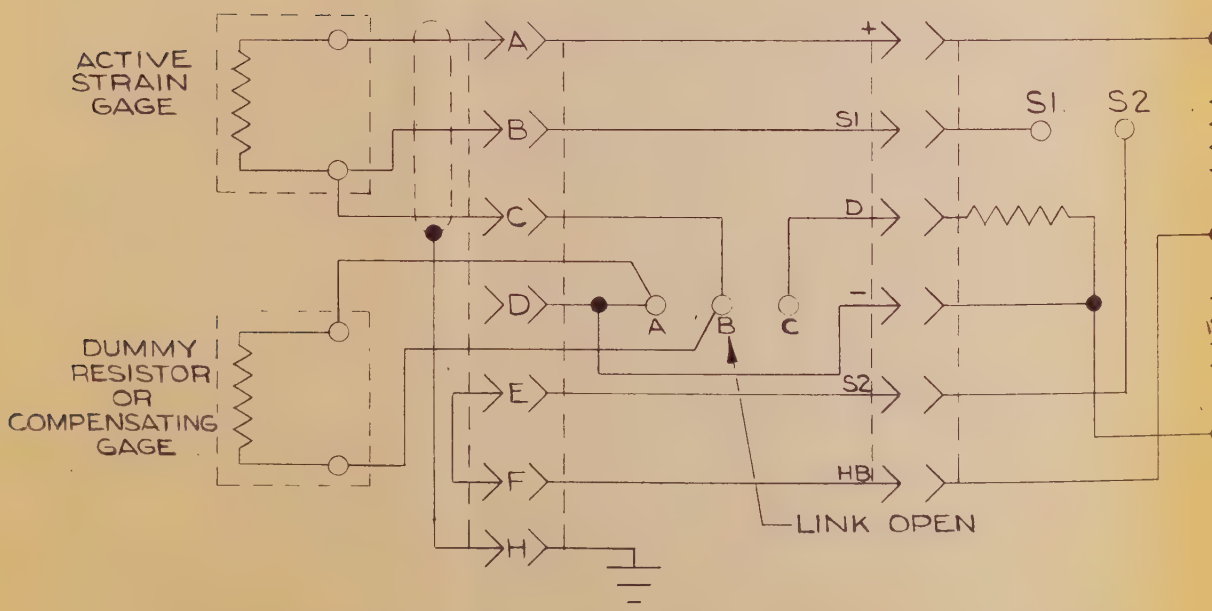
DATRAN SWITCH & BALANCE UNIT

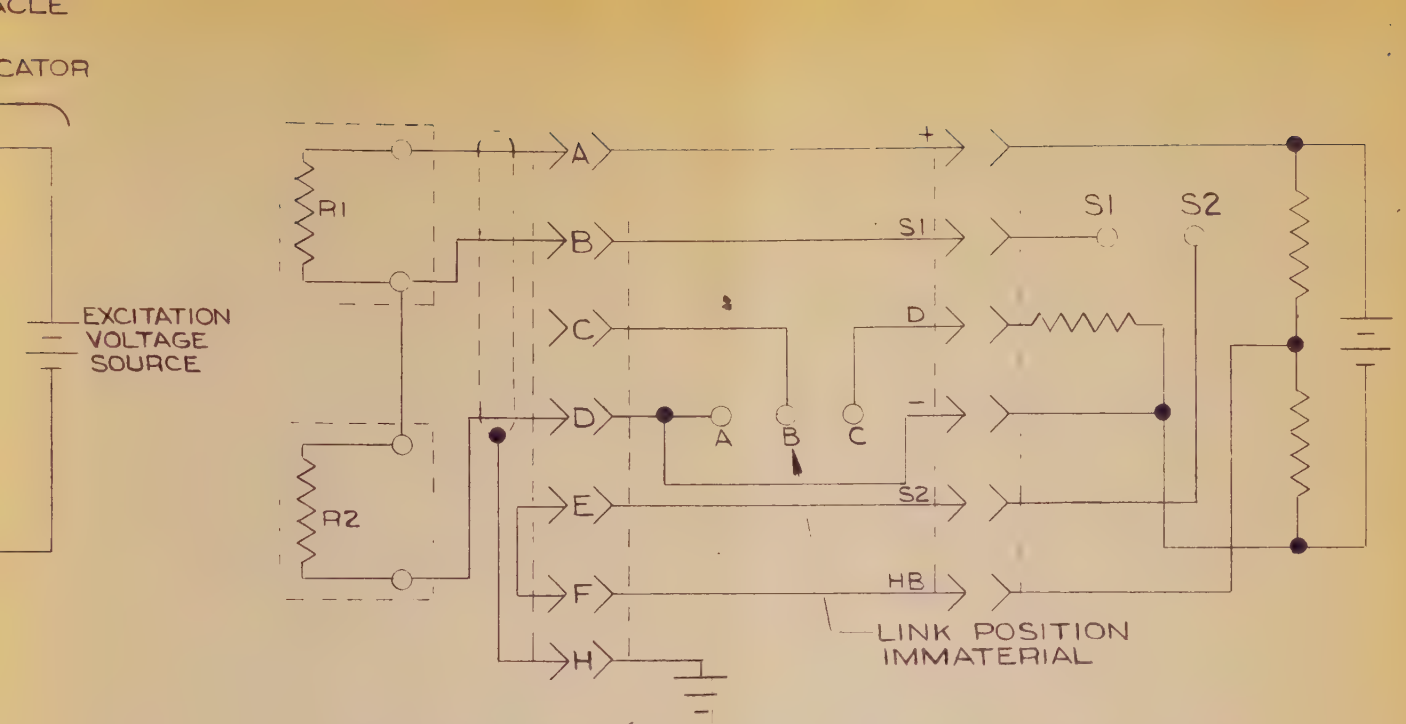
INSTRUMENTS Bud DIVISION
BOX 245 PHOENIXVILLE, PA.



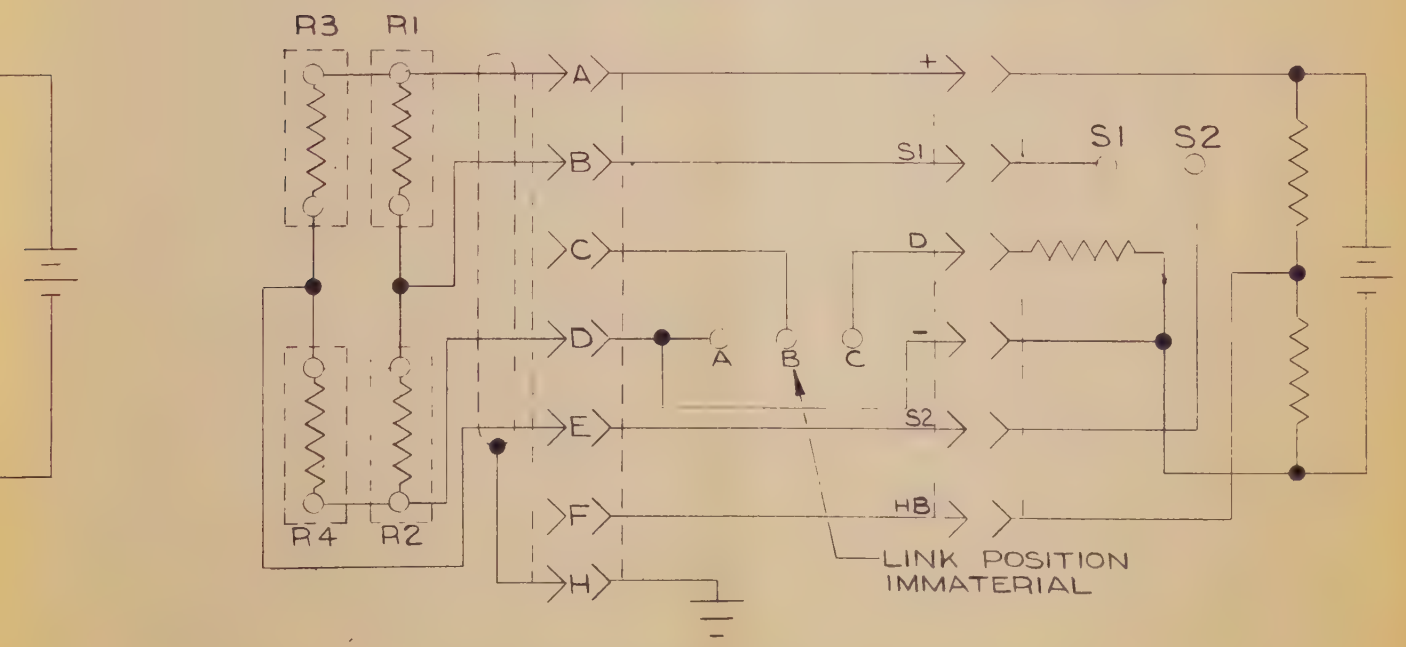
A. QUARTER-BRIDGE, DUMMY IN DIGITAL STRAIN INDICATOR



B. QUARTER BRIDGE, DUMMY OR TEMPERATURE COMPENSATING GAGE AT SWITCH & BALANCE UNIT



C. HALF-BRIDGE (OR QUARTER BRIDGE WITH COMPENSATING GAGE R2 AT ACTIVE GAGE)



D. FULL BRIDGE

FIGURE 3
INPUT WIRING TO INDIVIDUAL TRANDUCER RECEPTACLES ("T" OPTION)

DRAWN DELTUFFO	DATE 8-17-62	√ck	DATE 9-11-62	NUMBER 200-033974
DESIGNED J. Hastings	DATE 9-11-62	APPROVED	DATE	SHEET 3 OF 4

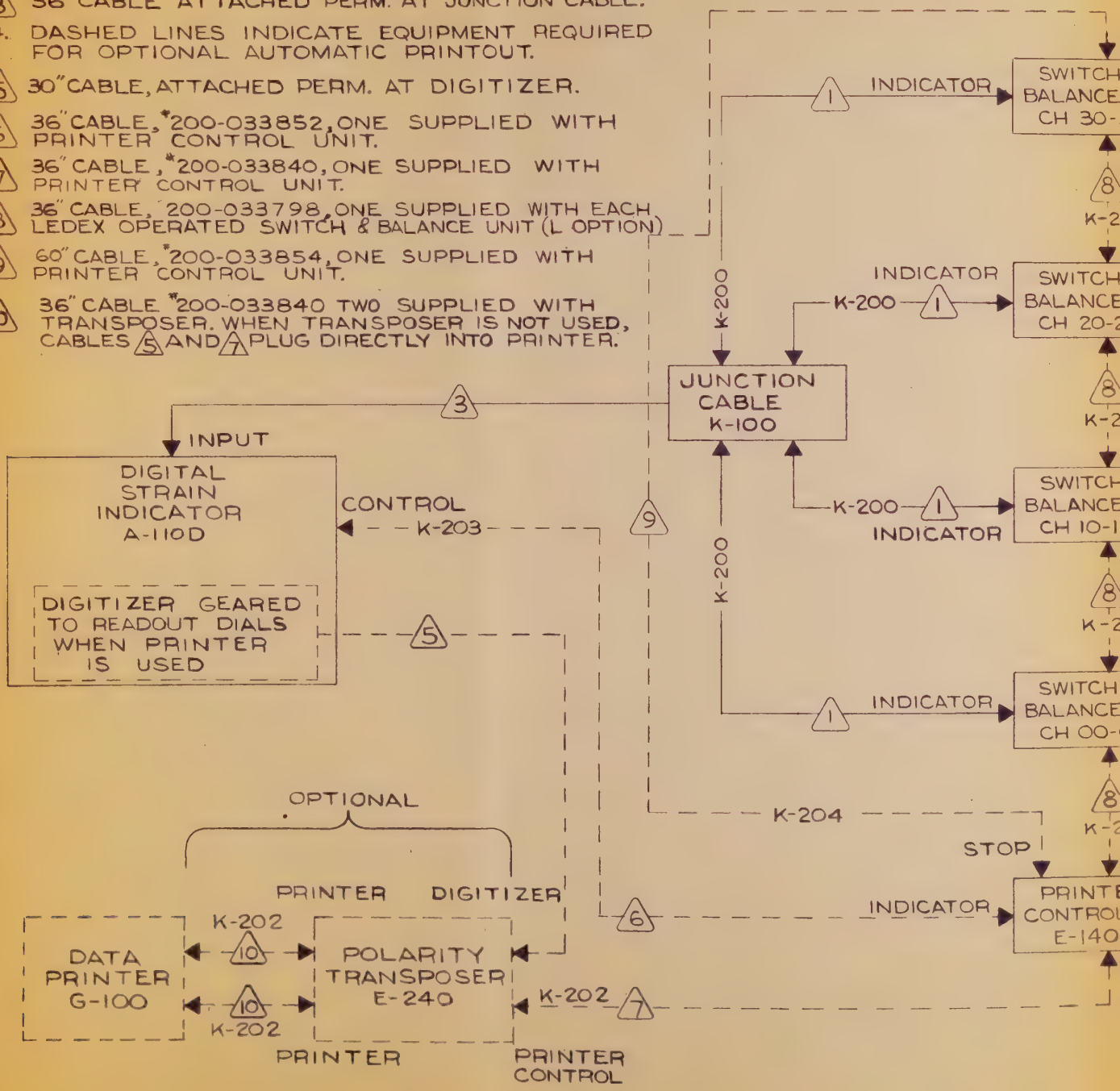
TITLE
OPERATING MANUAL
DATRAN SWITCH & BALANCE UNIT

INSTRUMENTS Bldi DIVISION
BOX 245 PHOENIXVILLE, PA.

NUMBER 200-033974

NOTES:

1. 36" CABLE, *200-033797 ONE SUPPLIED WITH EACH SWITCH & BALANCE UNIT.
2. 25' CABLE ATTACHED PERM. AT ADAPTER TERMINALS.
3. 36" CABLE ATTACHED PERM. AT JUNCTION CABLE.
4. DASHED LINES INDICATE EQUIPMENT REQUIRED FOR OPTIONAL AUTOMATIC PRINTOUT.
5. 30" CABLE, ATTACHED PERM. AT DIGITIZER.
6. 36" CABLE, *200-033852, ONE SUPPLIED WITH PRINTER CONTROL UNIT.
7. 36" CABLE, *200-033840, ONE SUPPLIED WITH PRINTER CONTROL UNIT.
8. 36" CABLE, 200-033798, ONE SUPPLIED WITH EACH LEDEX OPERATED SWITCH & BALANCE UNIT (L OPTION)
9. 60" CABLE, *200-033854, ONE SUPPLIED WITH PRINTER CONTROL UNIT.
10. 36" CABLE *200-033840 TWO SUPPLIED WITH TRANSPOSER. WHEN TRANSPOSER IS NOT USED, CABLES 5 AND 7 PLUG DIRECTLY INTO PRINTER.



| | | |

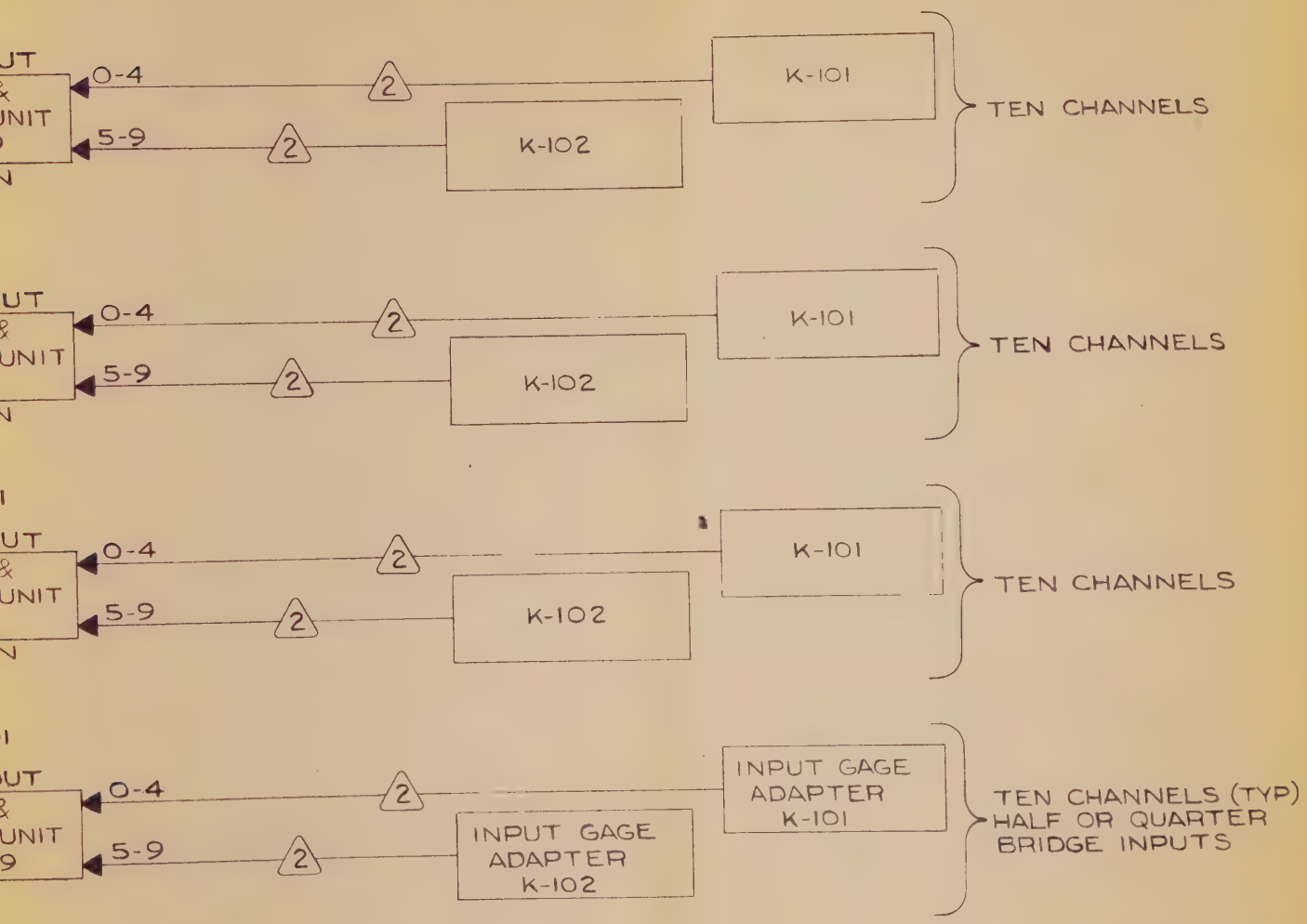


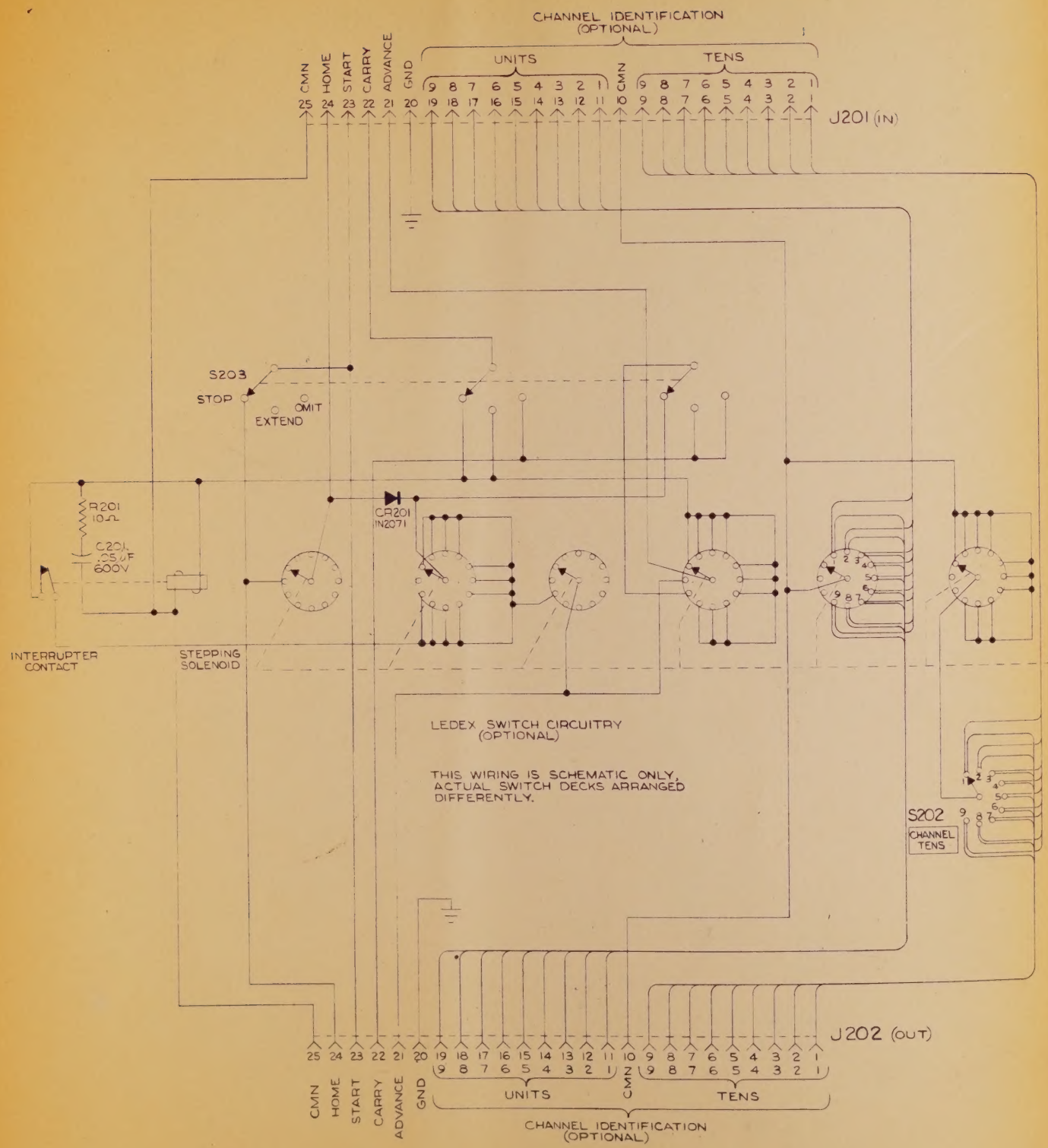
FIGURE 4
EQUIPMENT DIAGRAM - 40 CHANNEL SYSTEM

DRAWN DELTUFFO	DATE 8-20-62		DATE	NUMBER 200-033974
DESIGNED K Hastings	DATE	APPROVED	DATE	SHEET 4 OF 4

TITLE
OPERATING MANUAL
DATRAN SWITCH & BALANCE UNIT

INSTRUMENTS Bud DIVISION
BOX 245 PHOENIXVILLE, PA.

NUMBER 400-050677



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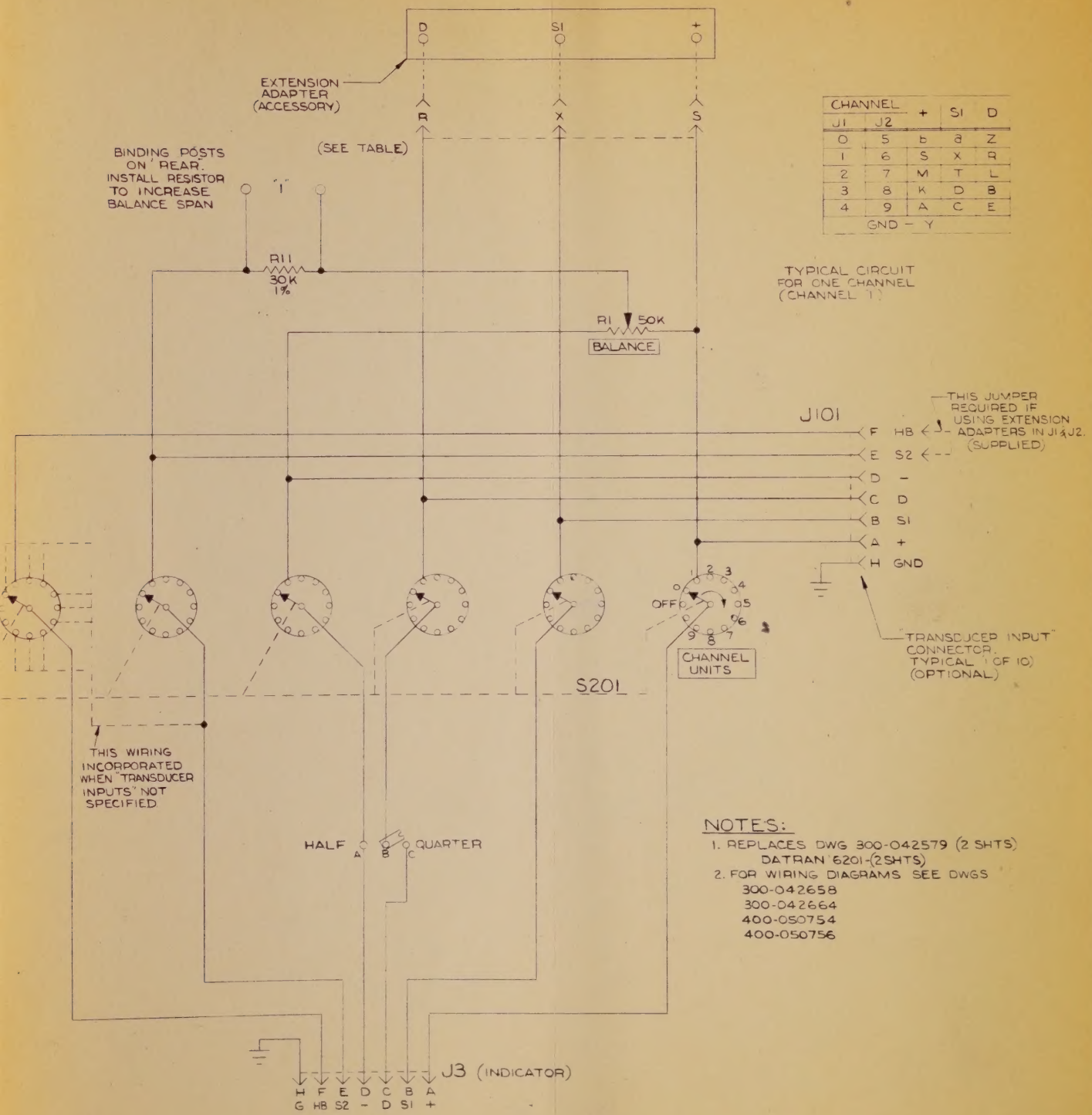

CHANNEL		+	SI	D
J1	J2			
0	5	b	d	Z
1	6	S	X	R
2	7	M	T	L
3	8	K	D	B
4	9	A	C	E
GND – Y				

TYPICAL CIRCUIT FOR ONE CHANNEL (CHANNEL 1)

NOTES:

1. REPLACES DWG 300-042579 (2 SHTS) DATRAN 6201-(2SHTS)
2. FOR WIRING DIAGRAMS SEE DWGS
   300-042658
   300-042664
   400-050754
   400-050756

DRAWN	DATE	CHECKED	DATE	NUMBER
PELTUFFO	7-26-62	JCH	7-31-62	400-050677
DESIGNED JCH	DATE 7-30-62	APPROVED	DATE	

TITLE
SCHEMATIC
DATRAN SWITCH AND

INSTRUMENTS Bradt